

AF Instruction 32-1023

Design and Construction Standards and Execution of Facility Construction Projects

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This instruction implements AFR 32-10, *Installations and Facilities*; Military Handbook 1190, *Facility Planning and Design Guide -- Technical Guidance*; and Military Handbook 1008, *Fire Protection for Facilities -- Engineering, Design, and Construction*. It provides general design criteria and standards; procedures for developing engineering technical letters (ETL) and technical data publications; guidance on selecting architect-engineering firms; and information on design and construction management. Send comments and suggested improvements on AF Form 847, **Recommendation for Change of Publication**, through channels, to HQ USAF/CEC, 1260 Air Force Pentagon, Washington DC 20330-1260. Attachment 1 is a glossary of references, abbreviations, acronyms, and terms.

Summary of Changes

This issuance aligns the instruction with AFR 32-10.

Chapter 1

Policy and General Standards

1.1. -- Applicability:

1.1.1. This instruction contains criteria for design and construction of facilities on Air Force installations (except family housing). Family housing criteria are contained in AFI 32-6002, Family Housing Programming, Design, and Construction (formerly AFR 88-25), and Military Handbook 1190, Facility Planning and Design Guide. The criteria in this chapter apply to all construction regardless of funding and also apply to:

- Properties listed or eligible for listing on the National Register of Historic Places.
- Air National Guard and Air Force Reserve projects constructed on Air Force installations (Reserve and Active).
- Air National Guard and Air Force Reserve projects constructed on non-DoD property.

1.1.2. These criteria apply to all Air Force installations in the fifty states, the District of Columbia, Puerto Rico, US territories and possessions, and as far as practical, at Air Force installations in foreign countries. In foreign countries, use local materials and construction methods if they produce economical, energy efficient and safe facilities.

1.2. -- Space Criteria.

Use AFH 32-1084, *Standard Facility Requirements Handbook* (formerly AFR 86-2), to determine space requirements instead of Military Handbook 1190. For Air National Guard facilities, use ANG (AF) 86-2, National Guard Planning Factors.

1.3. -- Design Excellence.

Excellence in design is a primary goal for all construction projects. Reaching this goal requires a commitment by designers and administrators to quality architecture. Design new facilities in harmony with the architectural character of existing facilities and the environment.

1.3.1. Pay particular attention to: siting, economy, life cycle cost, functionality, energy conservation, interior and exterior details, and disabled access.

1.3.2. Take special care to avoid adversely affecting the historic value of property listed (or eligible for listing) on the National Register of Historic Places, or located within the boundaries of an Historic District.

1.4. -- Design Flexibility.

The Air Force usually owns and operates facilities from the time of construction until the end of the structure's useful life. Over that period, the functional requirements of a building may change drastically. For this reason, flexibility is a major design requirement for all buildings.

1.5. -- Selection of Materials and Components.

Select economical materials by considering:

- Life cycle costs.
- Functional requirements.
- Fire safety.
- Expected length of use.

- Energy conservation and environmental factors (including renewable energy sources, local climatic conditions and construction practices).
- Environmental factors.
- Appearance.
- Maintainability.
- Recyclable materials (refer to AFI 32-7080, *Pollution Prevention Programs* (formerly AFR 19-15)).

Use standardized structural, mechanical, and electrical systems and equipment wherever practicable.

1.6. -- Categories of Construction.

To ensure the right kind of construction is programmed, classify each project in one of four categories of construction.

1.6.1. *Permanent.* This category of construction is required for most facilities at Air Force installations in the United States. and its possessions. Permanent facilities:

- Use design and construction quality suitable for a facility with a minimum life expectancy of 25 years with low maintenance requirements.
- Show reasonable cost, justified by a life-cycle cost approach.
- Use energy-efficient, environmental-, health-, and fire-safe design and conform to the requirements for non-combustible construction.

1.6.2. *Semipermanent.* Semipermanent facilities are used during peacetime in US possessions, where permanent construction is not economically justified; where structures have a high potential for obsolescence; and in foreign countries according to mutual intergovernmental agreements. Semipermanent facilities:

- Are structurally sound, energy efficient, and fire-, environmental- and health-safe.
- Cost less to build than permanent construction.
- Have a life expectancy more than 5 but less than 25 years with moderate maintenance.
- Normally use economical masonry, steel, or wood frame components.
- Are easy to maintain with economical but serviceable finishes.

1.6.3. *Temporary.* Temporary facilities are low-cost structures for temporary use (less than 5 years) at Air Force installations worldwide, where the cost of operation may be relatively high,

but maintenance is not a primary design consideration. Use of combustible materials is allowed, consistent with safeguarding life and property.

1.6.4. Protective. Protective construction uses passive methods and materials to:

- Reduce or nullify the effects of an attack on an installation
- Enhance recoverability of the installation after attack.

1.6.4.1. Protective construction includes:

- Separating and duplicating structures and activities.
- Strengthening (hardening) structures.
- Camouflaging or “toning down” painting.
- Physical protection against chemical, biological, and radiological agents.

1.6.4.2. Protective construction does not include all elements of passive defense, such as control of electronic emissions, use of protective clothing, and so on.

1.7. -- Preservation of Historic Resources:

1.7.1. Requirements for Compliance. DoD Directive 4710.1, *Archaeological and Historic Resources Management*, provides policy, prescribes procedures, and assigns responsibilities for managing archaeological and historic resources in and on waters and lands under DoD control. The Secretary of Interior’s Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings may also apply; consult AFI 32-7065, *Cultural Resources Management*.

1.7.2. Required Coordination. Coordinate all activities involving historic properties with the State Historic Preservation Officer. After coordination, obtain the comments of the Federal Advisory Council on Historic Preservation (reference 36 CFR 800, *Protection of Historic and Cultural Properties*).

1.7.3. Historic Preservation Plan and Archaeological Survey. Coordinate all construction, maintenance, repair, rehabilitation, alteration, or addition work to a district, site, building, structure, or object with the installation Historic Preservation Plan for possible adverse effects. When appropriate, conduct archaeological surveys to verify whether archaeological features are present at construction sites.

1.8. -- Voluntary Standards.

When practicable, use commercial voluntary standards instead of Government-developed standards and specifications.

1.9. -- Model Building Codes.

Comply with Air Force standards for design and construction and Military Handbook 1190. If applicable standards are not available, comply with the current edition of the Building Officials and Code Administrators code. For Air National Guard facilities, design to the locally-applicable standard building code. Comply with local building codes where practical when

constructing within urban areas. In case of a conflict between Air Force standards and local building codes, the more stringent requirement shall apply.

1.10. -- Air Force Occupational Safety and Health Program.

AFI 91-301, *The US Air Force Occupational Safety, Fire Prevention, and Health Program* (formerly AFR 127-12), establishes the Air Force Occupational Safety and Health (AFOSH) program. The AFOSH program applies to all levels and organizations of the Air Force. AFI 91-302, *Air Force Occupational Safety and Health Standards* (formerly AFR 8-14), establishes Air Force occupational safety and health standards. If no applicable standard is available, refer to Occupational Safety and Health Administration (OSHA) standards. If no applicable OSHA standard is available, refer to nationally recognized sources of health and safety criteria.

1.11. -- Fire Protection.

This instruction implements Military Handbook 1008, *Fire Protection for Facilities Engineering, Design, and Construction*.

1.12. -- Life Cycle Cost.

Base design decisions on life cycle cost considerations. Studies must balance initial construction cost with the operating and maintenance costs over the anticipated life of the facility to provide facilities at optimum cost. The anticipated life of the facility may exceed the 25 year minimum life expectancy for permanent construction.

1.13. -- Economic Analysis.

Conduct economic analyses routinely during the design process to ensure that design alternatives are based on the total cost of ownership. Use the present value discounting approach described in AFI 65-501, *Economic Analysis and Program Evaluation for Resource Management* (formerly AFR 173-15), and AFP 178-8, *Economic Procedures Handbook*, unless otherwise specified.

1.14. -- Asbestos Materials.

Use of asbestos-containing materials may result in excessive exposure for construction and maintenance personnel or building occupants. When exposure to asbestos fibers may occur from maintenance, repair or demolition operations, notify the Bioenvironmental Engineering Services office, and follow requirements and work practices in:

- AFI 32-1052, *Facility Asbestos Management* (formerly AFR 91-42).
- AFI 91-301, *Air Force Occupational and Environmental Safety, Fire Prevention, and Health Program* (formerly AFR 127-12).
- The Occupational Safety and Health Act of 1970 (29 CFR 1926.58).
- EPA 40 CFR 763G, *Asbestos Abatement Projects*.

1.14.1. *Asbestos Removal Projects.* Where the Bioenvironmental Engineering Services office determines that asbestos-containing materials pose a hazard, remove these materials. The Bioenvironmental Engineering Services office approves methods and procedures.

1.14.2. *Substitution Studies.* Where using nonfriable asbestos-containing material may result in worker or building occupant exposure above OSHA or Environmental Protection Agency (EPA) standards and guidelines, conduct a substitution study to justify its use. Carefully evaluate each planned use of asbestos-containing material to determine if an asbestos-free material can be used. Compare costs, performance characteristics, and actual or potential health hazards (including eventual demolition or removal at the end of the item's life) for each material. When an asbestos-containing material is clearly superior in performance and cost and doesn't present a health hazard to workers or building occupants, use the asbestos-containing material. When performance and cost for an asbestos-containing material nearly equals an asbestos-free material, use the asbestos-free material.

1.14.3. *Documentation.* Document all asbestos materials identified in facilities by the Base Civil Engineer and the Bioenvironmental Engineering Services office. Keep files, reports, studies, or other documents about asbestos.

Next Section